

CLAIMS:

1. A positioning control device for a two-stage actuator having a fine-movement actuator for supporting and positioning a head which reads or writes information from/to a disk and a coarse-movement actuator for positioning the fine-movement actuator which is mounted thereon, comprising coarse-movement control means which controls the coarse-movement actuator based on a head position signal which is obtained from information read out by the head, wherein:

the positioning control device further comprises:

a notch filter having a cutoff frequency  $f_n$  which is provided to the coarse-movement control means;

target value generation means which outputs instruction values for driving the fine-movement actuator at the frequency  $f_n$ ; and

adaptive identification means which estimates the gain of the fine-movement actuator from an actuating signal to the fine-movement actuator and the head position signal.

2. The positioning control device for a two-stage actuator according to claim 1, wherein the adaptive identification means is implemented by:

an identification model indicating characteristics of the fine-movement actuator;

a variable gain indicating gain of the fine-movement actuator to be estimated;

an identification model output signal as the product of the identification model and the variable gain; and

adaptive control means which controls the variable gain so as to reduce the deviation of the identification model output signal from the head position signal.

3. The positioning control device for a two-stage actuator according to claim 1, wherein the instruction values for driving the fine-movement actuator at the frequency  $f_n$  are target values forming a sine wave.

4. A positioning control device for a two-stage actuator having a fine-movement actuator for supporting and positioning a head which reads or writes information from/to a disk and a coarse-movement actuator for positioning the fine-movement actuator which is mounted thereon, comprising coarse-movement control means which controls the coarse-movement actuator based on a head position signal which is obtained from information read out by the head, wherein:

the positioning control device estimates the gain of the fine-movement actuator from an actuating signal to the fine-movement actuator and the head position signal in a state in which a response waveform of the head position signal coincides with a response waveform of the fine-movement actuator.

5. A positioning control device for a two-stage

actuator having a fine-movement actuator for supporting and positioning a head which reads or writes information from/to a disk and a coarse-movement actuator for positioning the fine-movement actuator which is mounted thereon, comprising control means which controls the fine-movement actuator and the coarse-movement actuator based on a head position signal which is obtained from information read out by the head, wherein:

the positioning control device further comprises adaptive identification means which employs: a coarse-movement identification model for estimating the position of the coarse-movement actuator based on control input to the coarse-movement actuator and a model of the coarse-movement actuator; and an estimated position signal regarding the fine-movement actuator that is obtained by subtracting the output of the coarse-movement identification model from the head position signal, and thereby estimates the gain of the fine-movement actuator from control input to the fine-movement actuator and the estimated position signal regarding the fine-movement actuator.

6. The positioning control device for a two-stage actuator according to claim 1, wherein the information writing to the disk by the head is prohibited if the gain of the fine-movement actuator estimated by the adaptive identification means became lower than a preset value.

7. The positioning control device for a two-

stage actuator according to claim 5, wherein the information writing to the disk by the head is prohibited if the gain of the fine-movement actuator estimated by the adaptive identification means became lower than a preset value.

8.           The positioning control device for a two-stage actuator according to claim 1, wherein control means for the fine-movement actuator is adjusted based on the gain of the fine-movement actuator estimated by the adaptive identification means.

9.           The positioning control device for a two-stage actuator according to claim 5, wherein the control means for the fine-movement actuator is adjusted based on the gain of the fine-movement actuator estimated by the adaptive identification means.